extracted features using the trained machine-learning based mapping, the one or more modified values of the extracted features reflecting the treatment scenario; and

analyzing the effect of the treatment scenario based on the first FFR and the second FFR.

11. The apparatus of claim **10**, the operations further comprising:

receiving a user input modifying one or more values of the extracted features to provide the one or more modified values of the extracted features.

12. The apparatus of claim **10**, wherein the trained machine-learning based mapping is trained based on FFR values corresponding to the synthetically generated stenosis geometries computed using computational fluid dynamics (CFD) simulations performed on the synthetically generated stenosis geometries.

13. The apparatus of claim **10**, wherein extracting features for a stenosis of interest from medical image data of a patient comprises:

extracting one or more features characterizing a geometry of the stenosis of interest.

14. The apparatus of claim **13**, wherein the one or more features characterizing the geometry of the stenosis of interest include one or more of proximal and distal reference diameters, minimal lumen diameter, lesion length, entrance angle, entrance length, exit angle, exit length, percentage of diameter blocked by the stenosis, and percentage of the area blocked by the stenosis.

15. The apparatus of claim **10**, wherein extracting features for a stenosis of interest from medical image data of a patient comprises:

extracting one or more features characterizing a morphology of the stenosis of interest.

16. A non-transitory computer readable medium storing computer program instructions for analyzing an effect of a treatment scenario, the computer program instructions when executed on a processor cause the processor to perform operations comprising:

extracting features for a stenosis of interest from medical image data of a patient;

determining a first fractional flow reserve (FFR) value for the stenosis of interest based on the extracted features using a trained machine-learning based mapping, wherein the trained machine-learning based mapping is trained based on geometric features extracted from synthetically generated stenosis geometries that are not based on patient-specific data;

determining a second FFR value for the stenosis of interest based on one or more modified values of the extracted features using the trained machine-learning based mapping, the one or more modified values of the extracted features reflecting the treatment scenario; and

analyzing the effect of the treatment scenario based on the first FFR and the second FFR.

17. The non-transitory computer readable medium of claim **16**, the operations further comprising:

receiving a user input modifying one or more values of the extracted features to provide the one or more modified values of the extracted features.

18. The non-transitory computer readable medium of claim **16**, wherein extracting features for a stenosis of interest from medical image data of a patient comprises:

extracting one or more features characterizing a geometry of a coronary artery branch in which the stenosis of interest is located.

19. The non-transitory computer readable medium of claim **16**, wherein extracting features for a stenosis of interest from medical image data of a patient comprises:

extracting one or more features characterizing a geometry of an entire coronary artery tree of the patient.

20. The non-transitory computer readable medium of claim **16**, wherein extracting features for a stenosis of interest from medical image data of a patient comprises:

extracting one or more features characterizing coronary anatomy and function.

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